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WHAT IS CLAIMED IS:

Rule
126
5 1. A method for the detection in, a patient suspected of having cancer, of the presence of residual cancer cells or micro-metastasis originating from solid tumors, comprising:

obtaining from the patient a cell-containing specimen of a sample selected from:

(1) body fluids,

10 (2) a rinse fluid that was in contact with the primary tumor site, and

(3) tissues, or organs other than the tissue primary tumor site; and

15 detecting the presence of H19 RNA in the specimen, a presence beyond that of a standard threshold, indicating the presence of residual cancer cells, and/or micro-metastasis originating from solid tumors in the patient.

20 2. A method for the determination, in a patient suspected of having cancer, of the amount of residual cancer cells or cancer cells from micro-metastasis originating from solid tumors, comprising:

obtaining from the patient a cell-containing specimen of a sample selected from:

(1) body fluids;

25 (2) a rinse fluid that was in contact with the primary tumor site, and

(3) tissues, or organs other than the tissue primary tumor site; and

30 quantifying the amount of H19 RNA in the specimen, and determining the amount of cancer cells by comparing the amounts of the quantified H19 mRNA in the sample to standard calibration curve of H19 mRNA as a function of the number of cancer cells, thereby determining the amount residual cancer cells or cancer cells from micrometastasis in the patient.

3. A method according to claim 1, further comprising the step of:

detecting the presence of at least one additional tumor marker in a cell-containing specimen of samples (1) to (3) a presence of both said additional tumor marker and H19 RNA beyond that of a standard threshold, indicating the presence of residual cancer cells and/or micro-metastasis from solid tumors in the patient.

4. A method according to claim 3, wherein the additional tumor marker is mRNA tumor marker.

5. A method according to claim 4, wherein the tumor marker is selected from: CK18, CK19, CK20, Mucin-1 (MUC-1), carcinoembryonic antigen; EWS-FL11EWS; ERG, PAX3-FKHR, FAX7-FKHR; prostate specific antigen (PSA), prostate membrane specific antigen; tyrosine hydroxylase, PGP 9.5, tyrosinase, PG6 9.5. MAGE (for melanoma), alpha-fetoprotein, albumin; and cytokeratins.

6. A method according to claim 1 or 2, wherein the solid tumor is selected from: carcinoma, sarcoma, adenoma, hepatocellular carcinoma, hepatoblastoma, rhabdomyosarcoma, esophageal carcinoma, thyroid carcinoma, ganglioblastoma, fibrosarcoma, myxosarcoma, liposarcoma, chondrosarcoma, osteogenic sarcoma, chordoma, angiosarcoma, endotheliosarcoma, lymphangiosarcoma, synovioma, Ewing's tumor, leiomyosarcoma, rhabdotheliosarcoma, colon carcinoma, pancreatic cancer, breast cancer, ovarian cancer, prostate cancer, squamous cell carcinoma, basal cell carcinoma, adenocarcinoma, renal cell carcinoma, hematoma, bile duct carcinoma, melanoma, choriocarcinoma, seminoma, embryonal carcinoma, Wilms' tumor, cervical cancer, testicular tumor, lung carcinoma, small lung carcinoma, bladder carcinoma, epithelial carcinoma, glioma (astrocytoma), medulloblastoma, craniopharyngioma, ependymoma, pinealoma, retinoblastoma, multiple myeloma, rectal carcinoma,

cancer of the thyroid, head and neck cancer, and cancer of the endometrium.

7. A method according to claim 1 or 2, wherein the body fluid is selected from: urine, blood, cerebro-spinal fluid, lymph fluid, lung embolism, sperm synovial fluid, saliva, and feces.

8. A method according to claim 1 or 2, wherein the rinse fluid was obtained by rising a body cavity is selected from: uterine, vagina, bladder, intraperitoneal cavity, gastrointestinal cavity, and lung.

9. A method according to claim 1 or 2, wherein said organ or tissue other than the primary tumor site is lymph node, bone marrow, peripheral stem cell harvests, lung or liver biopsies.

10. A method according to claim 1 or 2, wherein the RNA is detected in the sample by a method selected from: PCR, RT-PCR, in situ PCR, in situ RT-PCR, LCR and 3SR, and hybridization with a probe comprising a detectable moiety.

11. A method according to claim 1, wherein the standard threshold RNA level is established by:

(a) performing an RNA detection assay by adding varying and known amounts of H19 RNA to a sample selected from: a body fluid, a rinse fluid, bone marrow, lymph node, liver or lung tissue to produce a calibration curve showing the level of reading of the RNA detection assay as a function of the amounts of known H19 RNA;

(b) correlating the amounts of H19 in the calibration curve of (a) above, to the H19 RNA levels obtained from a plurality of diagnosed patients of a specific tumor, and the H19 RNA levels of a plurality healthy controls, when using the same sample and same RNA detection assay as used in (a) above; and

(c) defining an H19 level that differentiates between the amounts of H19 in the diagnosed patients and the

healthy controls, said differentiating H19 level being the standard threshold H19 level.

Rule 121
121. A kit for use in any of the methods of claim 1 to 10.